What is claimed is:

[Claim 1] 1. A photovoltaic (PV) laminate backplane assembly comprising:

an insulative substrate; and

a metal foil bonded to said insulative substrate on a first surface and electrically receptive for mounting a solar cell on a second surface opposite said first surface, said metal foil including a light concentrator disposed at exposed regions on said second surface of said metal foil, said light concentrator configured to reflect incident light thereon to said solar cell to increase a concentration of light on said solar cell in a range of about 1.5X to about 4X.

[Claim 2] 2. The assembly of claim 1, wherein said substrate comprises a polymeric substrate.

[Claim 3] 3. The assembly of claim 2, wherein said polymeric substrate comprises one of a flexible and a rigid polymer.

[Claim 4] 4. The assembly of claim 1, wherein said exposed regions on said second surface of said metal foil disposed proximate edges defining peripheral edges of said solar cell is one of augmented by a coating and mechanically modified to reflect light onto said solar cell and enhance light intensity thereon.

[Claim 5] 5. The assembly of claim 4, wherein said coating includes a reflective ink.

[Claim 6] 6. The assembly of claim 5, wherein said ink includes a colloidal suspension of glass spheres in an optically transparent binder.

[Claim 7] 7. The assembly of claim 1, wherein said metal foil is at least one of copper, aluminum and a conductive metal foil selected on a basis of cost, electrical, and thermal performance.

[Claim 8] 8. The assembly of claim 7, wherein said metal foil is patterned to match at least an interconnection configuration of said solar cell and a PV laminate module.

[Claim 9] 9. The assembly of claim 8, wherein said metal foil is configured to provide a low resistance interconnection of a plurality of solar cells while providing a thermal sink for heat generated by each cell.

[Claim 10] 10. The assembly of claim 9, wherein heat generated by at least one of said solar cells and absorbed solar radiation internal to said module is channeled to an edge defining said module via said metal foil.

[Claim 11] 11. The assembly of claim 10, wherein said edge defining said module is configured to dissipate said generated heat by one of radiation and convection.

[Claim 12] 12. The assembly of claim 1, wherein said metal foil functions as an electrical conductor, thermal conductor, and an optical reflector.

[Claim 13] 13. The assembly of claim 1, wherein said substrate includes a flexible polymer and said metal foil includes a reflective coating disposed proximate said edges of said solar cell.

[Claim 14] 14. The assembly of claim 1, wherein said substrate includes a plurality of metallized vias to allow dissipation of heat therethrough.

[Claim 15] 15. A solar cell laminate assembly comprising:

a plurality of solar cells each having a first side and a second side, each of said plurality of solar cells configured to produce an electrical current when receiving photons on at least said first side;

an encapsulant operably coupled to the first side of each of said plurality of solar cells;

an insulative substrate operably coupled to the second side of each of said plurality of solar cells; and

a metal foil bonded to said insulative substrate on a first surface and electrically receptive for mounting a solar cell on a second surface opposite said first surface, said metal foil including a light concentrator disposed at exposed regions on said second surface of said metal foil, said light concentrator configured to reflect incident light thereon to said each solar cell to increase a concentration of light on said each solar cell in a range of about 1.5X to about 4X.

[Claim 16] 16. The assembly of claim 15, wherein said substrate comprises a polymeric substrate.

[Claim 17] 17. The assembly of claim 16, wherein said polymeric substrate comprises one of a flexible and a rigid polymer.

[Claim 18] 18. The assembly of claim 15, wherein said exposed regions on said second surface of said metal foil disposed proximate edges defining peripheral edges of said each solar cell is one of augmented by a coating and mechanically modified to reflect light onto said each solar cell and enhance light intensity thereon.

[Claim 19] 19. The assembly of claim 18, wherein said coating includes a reflective ink.

[Claim 20] 20. The assembly of claim 19, wherein said ink includes a colloidal suspension of glass spheres in an optically transparent binder.

[Claim 21] 21. The assembly of claim 15, wherein said metal foil is at least one of copper, aluminum and a conductive metal foil selected on a basis of cost, electrical, and thermal performance.

[Claim 22] 22. The assembly of claim 21, wherein said metal foil is patterned to match at least an interconnection configuration of said each solar cell and a PV laminate module.

[Claim 23] 23. The assembly of claim 22, wherein said metal foil is configured to provide a low resistance interconnection of said plurality of solar cells while providing a thermal sink for heat generated by said each solar cell.

[Claim 24] 24. The assembly of claim 23, wherein heat generated by said plurality of solar cells or absorbed solar radiation internal to said module is channeled to an edge defining said module via said metal foil.

[Claim 25] 25. The assembly of claim 24, wherein said edge defining said module is configured to dissipate said generated heat by one of radiation and convection.

[Claim 26] 26. The assembly of claim 15, wherein said metal foil functions as an electrical conductor, thermal conductor, and an optical reflector.

[Claim 27] 27. The assembly of claim 15, wherein said substrate includes a flexible polymer and said light concentrator includes a reflective coating disposed

proximate said edges of said each solar cell.

[Claim 28] 28. The assembly of claim 15, wherein said substrate includes a plurality of metallized vias to allow dissipation of heat therethrough.